

Public Comment on the development of updates to underground injection regulations.

My name is Gerald Tonnelli, President of Production Data, Inc. We've been in business since 1972, making P.D.I. California's oldest wireline production logging company, running Steam Surveys up to 605 °F at 1625 psi.

My work experience started in 1960 when I was a summer hire with Chevron Oil Company. I later moved to the field and became an Open Hole Logging Engineer for 4 years. I started working on completed wells as a Production Logging Engineer, 4 years, running water Injection profiles, producing wells and fluid entry surveys, until we started P.D.I. in 1972.

Of all the innovations that P.D.I. has made, the one that we are the most proud is developing and introducing a new steam logging technique, Inert Gas Tracer Profiling. The D.O.G.G.R. made this new testing method as the only acceptable way of checking the integrity of steam injection wells.

Input on these new rules and regulations will allow the survey company to conduct their work in a safe and efficient manner, saving the customer time and money, while providing legitimate survey data that will determine the integrity of the well.

HIGH RATES vs LINE SPEED

Determining how fast is too fast in a well. The simple answer in our type of work is as long as you can see the radioactive tracer in the well, there is no need to try any other method in determining the integrity of the well. If R/A tracer is moving faster than the logging speed, and undetected, a tracer slug injected at the surface would be the last resort at these rates and pressures.

RADIOACTIVE BEADS

What benefit do radioactive beads do to enhance the interpretation of what is going on down hole? None. Radioactive beads that are out of zone raise more questions. What is that anomaly at that point?. All it does it create question. We are there to provide answers. R/A beads can give misleading information as to what is really going on down hole. It confuses the issue.

First you need to have the right kind of beads for the job. If you don't have the proper resin beads for the job, then you have a bunch of beads and radioactive water. Not all beads will hold the radioactive material.

Things to consider are the size of the beads so you don't plug up any perfs. The density of the beads is heavier than water. Beads hanging up on scale, a ledge, a joint, maybe sludge, or any

place in the well is going to give you an erroneous readings. Beads that have plated out, on the sand face, will remain in place until they are dissolved with acid. Any new radioactive tracer released will reactivate the beads and cause more question than answers. Why is the background level of radioactivity increasing? What is causing this anomaly? More questions than answers.

INJECTION FLUID

A well needs to be tested with whatever fluid is being injected in the well prior to the test, at its scheduled rate and pressure. If you are injecting water you expect to test using water. Same thing holds for steam. If you are running a steam survey, you do not want to substitute steam at 1200 psi at 580°F for 60°F lease water and expect to conduct a valid test, it's a charade, going through all the motions but you're not really testing under dynamic conditions.

Inject with water, test with water, inject with steam, test with steam.

TEMPERATURE SURVEYS

Temperature surveys are and have been restricted to 30' / minute. It would take 5 hours to log a 9000' well. Modifying the logging speed would be beneficial to the costumer without compromising data.

Downhole Memory tools or downhole temperature "bombs" cannot be used since the data can only be seen after coming out of the well and downloading the stored readings. You can't adjust the speed to well conditions.

You need a logging system that has a surface read out so you can instantly see, the temperature in the well. You should be able to log fast enough to spend the least amount of time in the well and log slow enough to see any anomalies.

P.D.I.'s logging system will instantly "see" a temperature change. If this change is small then the logging speed is slow enough at these conditions. If in doubt, stop the logging run and see how much the temperature changes, something less than 5°F at this stationary depth would be acceptable to continue down the well.

As long as the temperature doesn't change you can maintain a higher logging speed until you see a change, or reach a fluid level, or the zone of interest.

At these points a slow logging speed will be necessary, so the logging system can keep up with the well conditions, even logging less than 30' /min in the well.

At the logging speed that we run, we will not miss any anomalies in the well. The only thing that would happen is that the temperature survey would be "pushed down" the well. The

temperature plot would show the temperature recordings, a little deeper than where they are. We need to be able to adjust the logging speed to coincide with the downhole conditions.

NOISE LOGGING TOOL

1724.10.1 (c)(1) regarding testing method the noise tool at a stationary point listening for migration behind the pipe, the injectivity down the tubing must be turned off. The well should be at a static condition. We are trying to find or hear fluid moving behind the pipe. If the water is on, then all you will hear is water moving pass the tool. It will mask out what is going on behind the pipe, if, it is indeed moving behind the pipe.

UIC WITNESS

The people sent out to witness the surveys need to be as smart as or smarter than the people running the job. They have to know that the material being used for the job is the correct material for the job and is what the surveyor say it is. Is it really Inert Gas Tracer? Iodine -131?. Is the amount of material enough to differentiate between background and the R/A tracer? What is acceptable, R/A tracer intensity, 5 times above background, 4 times above background? Each situation is different but the witness should know enough to say whether it is sufficient or not for the job.

Depth control, they need to know how to read a casing collar locator to figure out if they are on depth or not. Are they at the correct spot in the well to conduct the correct test at that point or not? Can they locate the packer/tubing tail in the well? The witness should be aware of the situation and make any procedure changes if the surveyor lacks experience.

TWO POINT INTEGRITY CHECK

1724.10.1(6)- test shall take whatever time that is necessary to make a legitimate test based on fluid rates. A second test can be made at a different depth if R/A tracer indicates a failure at the first test point. If the test at the first test point is valid, then there is no need to do a second test. The test point depth does not have to be based on the well lithology. R/A tracer release should be intense enough so that the gamma sensitivity is not that important when identifying well problems. What is important to see is the difference between the gamma background and the R/A tracer slug.

The changes boil down to two standard rules when it comes down to our type of work. The first standard is to adjust logging speed to coincide with downhole conditions. The second standard is for R/A tracer testing. If you see R/A tracer in the wellbore then we know we have proof R/A tracer was released. If you don't see any indications of R/A tracer in the wellbore due to high rates then we don't have proof that we put a shot out. Releasing R/A at the surface and recording the gamma slug moving pass the gamma detector would prove R/A was released.

Of the four methods of testing, it should be up to the surveyor to use the best technique for a valid test which would be based on well conditions, rates.

Our crew when conducting the test will communicate with the witness on what we are doing and why we are doing it, and what we expect. If for some reason the test fails we can duplicate the same test to make sure it wasn't a fluke. We try to educate our witnesses before hand so we can minimize questions later and get it right the first time.

I would make myself available to have a "sit down" meeting to discuss these points or anything else. Let me know.

Jerry Tonnelli

661-978-3152

